

REMARKS

[0001] The following paragraphs are numbered for ease of future reference. Claims 45-59 are all the claims presently pending in this application. Claims 45-59 have been added to claim additional features of the claimed invention by defining “vertical wall surfaces” in place of “rectangular portions.” Thus, claims 30-44 have been canceled.

[0002] Applicant further respectfully submits that no new matter is added to the currently amended claims, nor has the scope of the pending claims changed. Applicant respectfully traverses the rejections based on the following discussion.

I. THE PRIOR ART REJECTION

The 35 U.S.C. § 103(a) Rejection over Rostoker

[0003] Claims 30-44 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rostoker, U.S. Pat. No. 5,662,768, (hereinafter “Rostoker”).

[0004] The Examiner repeats the rejection from the previous After Final Office Action mailed on October 7, 2008, and further alleges on page 8 of current Non-Final Office Action that, “it is noted that regarding to the rectangular portions and the dimensions, it has been held that where the general conditions of the claims are disclosed in the prior art, a change in thickness, size, or shape without a significant function is not inventive to discover the optimum or workable range by routine experimentation.” (Emphasis added.)

[0005] However, Applicant’s respectfully traverse the Examiner’s application of *In re Aller* to Applicant’s claimed invention since the claimed “vertical sidewalls” and their disposition with respect to the opening in the substrate have a significant function.

[0006] For example, Applicant discloses at page 8, line 15 to page 9, line 4, of the Specification that the vertical sidewall, or “step” may be used to form a vertical transistor as shown in Fig. 4B and Figs. 14-21. Additionally, for example, Applicant discloses on page 10, lines 5-6, of the Specification that the vertical walls are useful in low resistance buried bit-line formations and other similar applications. Furthermore, for example, Applicant discloses on page 12, lines 14-18 of the Specification that the vertical walls have an advantage of being self-aligned to the bottom of an initial trench to result in a more uniform capacitance distribution. Additionally, for example, Applicant discloses beginning on page 14, line 4 and Figs. 22-26 how Applicant’s claimed vertical walls are used to improve the formation and performance of electrical devices, for example, a dual-gate transistor.

[0007] Applicant traverses the Examiner’s rejection since, among other reasons, Rostoker discloses at Fig. 1f a completed trench having three indentations 16 in each trench sidewall 14 where the indentations 16 are generally curvilinear in shape, while Applicant’s claimed invention is directed toward vertical walls formed beneath an upper surface of a substrate being substantially orthogonal to the upper surface of the substrate.

[0008] More specifically, Applicant submits, that Rostoker fails to teach or suggest, “a first vertical wall substantially orthogonal to and intersecting said upper surface at said opening and said second surface,” and “a second vertical wall substantially orthogonal to and intersecting said second and said third surfaces,” per Applicant’s independent claims 45 and 55, and additionally “a third vertical wall substantially orthogonal to and intersecting said third and fourth surfaces,” per Applicant’s independent claim 50.

[0009] Rostoker discloses, “FIG.1f illustrates a completed trench having three indentations 16 in each trench sidewall 14” at column 6, lines 13-14. Each of the three indentations 16 are

substantially curvilinear in shape and have are not substantial orthogonal to the upper surface of the substrate. Rostoker further discloses at column 6, lines 29-31, that the dry trench etching performed on the exposed regions through which impurities are implanted “allows the trench to have a substantially nonlinear profile and it allows the trench to occupy relatively little area on the top surface of the substrate.” (Emphasis added.) Therefore, Rostoker teaches away from Applicant’s claimed invention of “a first vertical wall substantially orthogonal to and intersecting said upper surface at said opening and said second surface,” and “a second vertical wall substantially orthogonal to and intersecting said second and said third surfaces.”

[0010] In summary, Rostoker discloses at Fig. 1f a completed trench having three indentations 16 in each trench sidewall 14 where the indentations 16 are generally curvilinear in shape, while Applicant’s claimed invention is directed toward vertical walls formed beneath an upper surface of a substrate being substantially orthogonal to the upper surface of the substrate.

[0011] Therefore, Applicant respectfully requests the Examiner to reconsider and withdraw this rejection since Rostoker fails to teach or suggest each element and feature of Applicant’s claimed invention.

II. FORMAL MATTERS AND CONCLUSION

[0012] In view of the foregoing, Applicant submits that claims 45-59, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

[0013] Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to

Application No. 09/895,198
Docket No. Y0999-247DIV

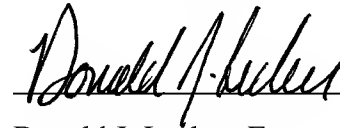
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discuss any other changes deemed necessary in a telephonic interview.

[0014] The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 50-0510.

Date: March 30, 2009

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Donald J. Lecher", written over a horizontal line.

Donald J. Lecher, Esq.
Registration No. 41,933

GIBB IP LAW FIRM, LLC
2568-A Riva Road, Suite 304
Annapolis, Maryland 21401
Voice: 410-573-6501
Fax: 301-261-8825
E-mail: Lecher@gibbiplaw.com
Customer No. 29154